

# Interoperability Workshops Results Interpretation by Russian Federation

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# Common Questions (1)

- What types of applications do receivers from your company (or receiver designs) support?
- There is a threat for GNSS receivers due to many more GNSS signals centered at 1575.42 MHz . So do you prefer all new CDMA signals at “L1” to be centered at 1575.42 MHz or have some of them elsewhere, e.g., at 1602 MHz?

**RF – prefer elsewhere**

**China – prefer at 1575.42 MHz – 50 %**

**US – prefer at 1575.42 MHz - 50%**

**Japan – prefer at 1575.42 – 83% (most doubts come from med/high prec.)**

- Once there are a large number of good CDMA signals, will there be continuing commercial interest in FDMA signals?

**RF – there will be interest – 57%**

**China – there will be interest – 21%**

**USA – there will be interest – 18%**

**Japan – there will be interest – 0%**

# Common Questions (2)

- **Given that L5/E5a will be transmitted by most GNSS providers, do you intend to use the E5b signal?**

**RF – yes, intend – 60%**

**China – yes, intend – 42%**

**USA – yes, intend – 40%**

**Japan – yes, intend – 33% (those who intend 100% med./high prec.)**

- **Assuming signal quality is acceptable from every provider, would you limit the number of signals used by provider?**

**RF – would limit – 43%**

**China – would limit – 57%**

**USA – would limit – 78%**

**Japan – would limit – 33%**

# Common questions (3)

- **Importance of common center frequency for the best interoperability?**

**RF - important – 20 %**

**China – important – 75%**

**USA – important – 67%**

**Japan – important – 83%**

- **Will you provide “three-lane navigation” capability in the future?**

**RF – will provide – 100%**

**China – will provide - 93%**

**USA – 46%**

**Japan – 34% (100% for med./high prec.)**

- **Does a wider satellite transmitter bandwidth help with multipath mitigation?**

**RF – does help – 80%**

**China – does help – 50%**

**USA – does help – 80%**

**Japan – does help – 67%**

# Common questions (4)

- **Would you recommend GNSS or SBAS services provide interoperability parameters: system clock offsets, geodesy offsets, ARAIM parameters or others?**

**RF – would recommend – 100%**

**China – would recommend – 71,5%%**

**USA – would recommend – 100%**

**Japan – would recommend – 83%**

- **Should the international community strive to protect all GNSS signal bands from terrestrial signal interference**

**Should strive to protect – UNANIMOUS**

# Common center frequency

- **Nearly half to half (common center frequency comes from mass market apps., different center frequencies come from med./high prec. apps)**

# FDMA Signals

- **There are and there will be users of FDMA signals:**

**Even 20% of users is a substantial number of users**

# E5b Signal

- **No doubt it will be used**  
**40% at a minimum is good enough**



# Limitation of the number of signals used

- **Most likely, at least for mass market applications**

# **Importance of common center frequency for the best interoperability**

- **For mass market equipment and applications**

# “Three-lane navigation” capability

- **Mostly yes**

# Wider satellite transmitter bandwidth

- **Helps with multipath mitigation**

# Recommendation to provide interoperability parameters

- **Certainly would recommend**

# General Conclusions (Russian View)

- Diversification of signals ensures diversification of applications. Benefits and costs should be weighed against each other.
- All available signals will be received and processed by any receivers including mass market (having in mind the Moore's Law).
- All received signals will have different weight (depends on the signal quality) when being processed
- Central frequency diversity is the positive factor for interference resilience
- FDMA signals have distinct advantage in terms of interference protection
- Supporting PTA concept all available sources of navigation information, including as many available signal as are provided, will (shell) be used
- Political (regional) factors could predetermine which signals are to be proceed as a prime and which are to be processed to augment